## CLAIMS

What is Claimed is:

1. A polyphase filter comprising

a first phase splitting filter that produces a first output,

a second phase splitting filter that produces a second output,

a first variable resistance connected across the first output, and

circuitry capable of detecting the phase of the outputs produced by the first and second outputs, and circuitry capable of adjusting the first variable resistance to produce a desired phase difference between the first output and the second output.

2. The filter of claim 1 wherein the first output and the second output are single-ended outputs.

3. The filter of claim 1 wherein the first and the second outputs are differential outputs.

4. The filter of claim 1 comprising a second variable resistance connected across the second output.

5. The filter of claim 4 wherein the first variable resistance and the second variable resistance include transistors.

6. The filter of claim 5 wherein the transistors include at least one MOSFET transistor operated in the linear range.

7. The filter of claim 4 wherein the first variable resistance and the second variable resistance include a bipolar differential pair.

8. The filter of claim 4 wherein the first variable resistance and the second variable resistance include a digitally switchable resistance.

9. The filter of claim 1 wherein the circuitry capable of detecting the phase of the outputs includes a phase detector, an integrator and a differential amplifier.

10. The filter of claim 1 wherein the circuitry capable of detecting the phase of the outputs includes a phase detector, an integrator, a differential amplifier, a capacitor and a controller for selectively storing and holding the output of the differential amplifier in the capacitor.

11. The filter of claim 1 wherein a local oscillator provides a fixed frequency signal to inputs of the first phase splitting filter and the second phase splitting filter,

an RF test signal source provides a test signal which is mixed with the first output and the second output to produce an I-based band signal and a Q-based band signal,

the circuitry capable of detecting the phase of the outputs including a phase detector which detects phase differences between the I-based band signal and the Q-based band signal, and an integrator, and

the circuitry capable of adjusting the first variable resistance includes a differential amplifier having an input connected to the output of the integrator, the differential amplifier producing an output to the first variable resistance.

12. The filter of claim 1 wherein a local oscillator provides a fixed frequency signal to inputs of the first phase splitting filter and the second phase splitting filter,

an RF test signal source provides a test signal which is mixed with the first output and the second output to produce a first baseband signal and a second baseband signal,

the circuitry capable of detecting the phase of the outputs includes a phase detector which detects phase differences between the first baseband signal and a second baseband signal, and an integrator, and

the circuitry capable of adjusting the first variable resistance includes a differential amplifier having an input connected to the output of the integrator, the differential amplifier producing an output to the first variable resistance when a switch is closed, the differential amplifier output being stored in a capacitor that provides the differential amplifier output to the first variable resistance when the switch is open.

13. A polyphase filter, comprising

a first phase splitting filter that produces a first output;

a second phase splitting filter that produces a second output;

a first variable resistance connected across the first output; and

a detector that determines the phase of the first and second outputs, and adjusts the first variable resistance to produce a desired phase difference between the first output and the second output.

14. The filter of claim 13 wherein the first output and the second output are single-ended outputs.

15. The filter of claim 13 wherein the first and the second outputs are differential outputs.

16. The filter of claim 13 comprising a second variable resistance connected across the second output.

17. The filter of claim 16 wherein the first variable resistance and the second variable resistance include transistors.

18. The filter of claim 17 wherein the transistors include at least one MOSFET transistor operated in the linear range.

19. The filter of claim 16 wherein the first variable resistance and the second variable resistance include a bipolar differential pair.

20. The filter of claim 16 wherein the first variable resistance and the second variable resistance include a digitally switchable resistance.

21. The filter of claim 13 wherein the detector includes a phase detector, an integrator and a differential amplifier.

22. The filter of claim 13 wherein the detector includes a phase detector, an integrator, a differential amplifier, a capacitor and a controller for selectively storing and holding the output of the differential amplifier in the capacitor.

23. The filter of claim 13 wherein a local oscillator provides a fixed frequency signal to inputs of the first phase splitting filter and the second phase splitting filter, and

an RF test signal source provides a test signal that is mixed with the first output and the second output to produce an I-baseband signal and a Q-baseband signal,

the detector including a phase detector which detects phase differences between the I-based band signal and the Q-baseband signal, and an integrator, and

the detector further including a differential amplifier having an input connected to the output of the integrator, the differential amplifier producing an output to the first variable resistance.

24. The filter of claim 13 wherein a local oscillator provides a fixed frequency signal to inputs of the first phase splitting filter and the second phase splitting filter, and

an RF test signal source provides a test signal that is mixed with the first output and the second output to produce a first baseband signal and a second baseband signal,

the detector including a phase detector that detects phase differences between the first baseband signal and a second baseband signal, and an integrator,

the detector further including a differential amplifier having an input connected to an output of the integrator, the differential amplifier producing an output to the first variable resistance when a switch is closed, the differential amplifier output being stored in a capacitor that stores the differential amplifier output and provides the differential amplifier output to the first variable resistance when the switch is open.

25. A communication system comprising a transmitter and a receiver,

the transmitter comprising an input, an analog-to-digital converter, a digital signal processor, a digital-to-analog converter and an RF signal generator, the transmitter modulating an RF carrier with a signal provided to the transmitter input and transmitting the modulated RF carrier,

the receiver comprising an RF input, a local oscillator, a polyphase filter connected to an output of the local oscillator, the polyphase filter producing first and second outputs from the local oscillator output, a mixer that combines the RF input with the first and second outputs of the polyphase filter, baseband circuitry, an analog-to-digital converter, and a digital signal processor that demodulates an output of the analog-to-digital converter, and produces a demodulated output,

the polyphase filter including

a first phase splitting filter that produces the first output,

a second phase splitting filter that produces the second output,

a first variable resistance connected across the first output, and

circuitry capable of detecting the phase of the first and second outputs, and adjusting the first variable resistance to produce a desired phase difference between the first output and the second output.

26. The system of claim 25 wherein the phase is substantially continuously detected and adjusted in a closed loop manner.

27. The system of claim 25 wherein the phase is adjusted at predetermined times in an open loop manner.

28. A method for obtaining accurate quadrature separation of phase components on a radio frequency carrier that can be mapped on an I-Q plane, comprising:

generating a fixed local oscillator frequency;

splitting the local oscillator frequency into two signals having a predetermined phase difference to produce a first output and a second output;

mixing the first output and the second output with a radio frequency test signal to generate an I baseband signal and a Q baseband signal;

detecting the phase difference between the I baseband signal and the Q baseband signal; and

adjusting the phase difference of the first output and/or the second output to produce a desired phase difference between the I baseband signal and the Q baseband signal.